

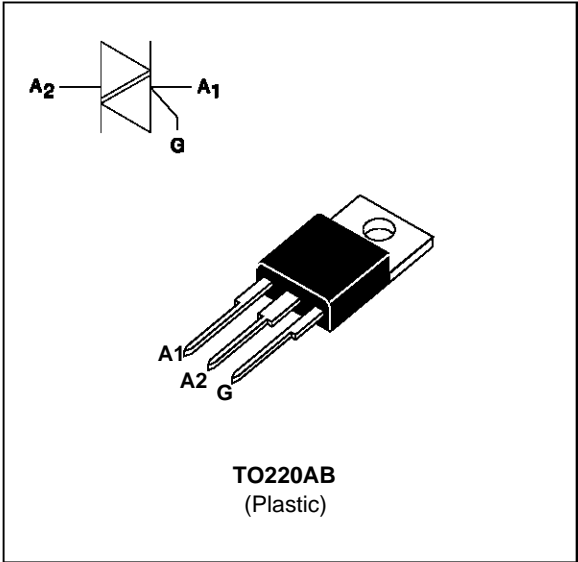
LOGIC LEVEL TRIACS

FEATURES

- LOW  $I_{GT} = 10\text{mA max}$
- HIGH EFFICIENCY SWITCHING ON COMMUTATION
- BTA Family :  
INSULATING VOLTAGE = 2500V(RMS)  
(UL RECOGNIZED : E81734)

DESCRIPTION

The BTA/BTB12 SW Triac family are high performance products glass passivated PNP devices. These parts are suited for low power trigger circuit (integrated circuits, microcontroller, microprocessors).



ABSOLUTE RATINGS (limiting values)

| Symbol                             | Parameter  |                         |                        | Value                          | Unit             |
|------------------------------------|--|-------------------------|------------------------|--------------------------------|------------------|
| I <sub>T(RMS)</sub>                | RMS on-state current<br>(360° conduction angle)  | BTA                     | T <sub>c</sub> = 70 °C | 12                             | A                |
|                                    |  | BTB                     | T <sub>c</sub> = 75 °C |                                |                  |
| I <sub>TSM</sub>                   | Non repetitive surge peak on-state current<br>( T <sub>j</sub> initial = 25°C )                                  | tp = 8.3 ms             |                        | 126                            | A                |
|                                    |  | tp = 10 ms              |                        | 120                            |                  |
| i <sup>2</sup> <sub>t</sub>        | i <sup>2</sup> <sub>t</sub> value  |                         | tp = 10 ms             | 72                             | A <sup>2</sup> s |
| di/dt                              | Critical rate of rise of on-state current<br>Gate supply : I <sub>G</sub> = 50mA   di <sub>G</sub> /dt = 0.1A/μs | Repetitive<br>F = 50 Hz |                        | 20                             | A/μs             |
|                                    |  | Non<br>Repetitive       |                        | 100                            |                  |
| T <sub>stg</sub><br>T <sub>j</sub> | Storage and operating junction temperature range   |                         |                        | - 40 to + 150<br>- 40 to + 110 | °C<br>°C         |
| TI                                 | Maximum lead temperature for soldering during 10 s at 4.5 mm from case   |                         |                        | 260                            | °C               |

| Symbol                 | Parameter  | BTA / BTB12- |        |        | Unit |
|------------------------|--|--------------|--------|--------|------|
|                        |  | 400 SW       | 600 SW | 700 SW |      |
| $V_{DRM}$<br>$V_{RRM}$ | Repetitive peak off-state voltage<br>$T_j = 110\text{ }^{\circ}\text{C}$ | 400          | 600    | 700    | V    |

**THERMAL RESISTANCES**

| Symbol       | Parameter   |     | Value | Unit |
|--------------|---|-----|-------|------|
| Rth (j-a)    | Junction to ambient                                       |     | 60    | °C/W |
| Rth (j-c) DC | Junction to case for DC                                   | BTA | 3.3   | °C/W |
|              |   | BTB | 2.7   |      |
| Rth (j-c) AC | Junction to case for 360° conduction angle<br>(F = 50 Hz) | BTA | 2.5   | °C/W |
|              |   | BTB | 2     |      |

**GATE CHARACTERISTICS** (maximum values)

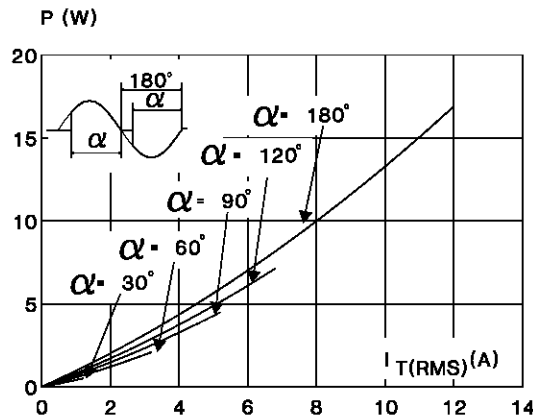
$P_G$  (AV) = 1W     $P_{GM}$  = 10W (tp = 20 μs)     $I_{GM}$  = 4A (tp = 20 μs)     $V_{GM}$  = 16V (tp = 20 μs).

**ELECTRICAL CHARACTERISTICS**

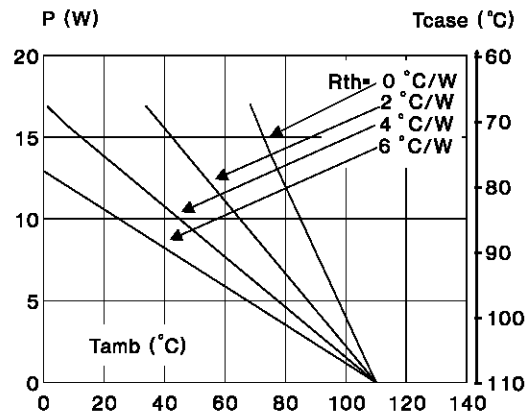
| Symbol                 | Test Conditions                                      |                   | Quadrant |     | Suffix | Unit |
|------------------------|--|-------------------|----------|-----|--------|------|
|                        |  |                   |          |     | SW     |      |
| $I_{GT}$               | $V_D=12V$ (DC) $R_L=33\Omega$                        | $T_j=25^\circ C$  | I-II-III | MAX | 10     | mA   |
| $V_{GT}$               | $V_D=12V$ (DC) $R_L=33\Omega$                        | $T_j=25^\circ C$  | I-II-III | MAX | 1.5    | V    |
| $V_{GD}$               | $V_D=V_{DRM}$ $R_L=3.3k\Omega$                       | $T_j=110^\circ C$ | I-II-III | MIN | 0.2    | V    |
| tgt                    | $V_D=V_{DRM}$ $I_G = 40mA$<br>$di_G/dt = 0.5A/\mu s$ | $T_j=25^\circ C$  | I-II-III | TYP | 2      | μs   |
| $I_L$                  | $I_G=1.2 I_{GT}$                                     | $T_j=25^\circ C$  | I-III    | TYP | 15     | mA   |
|                        |  |                   | II       |     | 25     |      |
| $I_H$ *                | $I_T= 100mA$ gate open                               | $T_j=25^\circ C$  |          | MAX | 25     | mA   |
| $V_{TM}$ *             | $I_{TM}= 17A$ tp= 380μs                              | $T_j=25^\circ C$  |          | MAX | 1.75   | V    |
| $I_{DRM}$<br>$I_{RRM}$ | $V_{DRM}$ Rated<br>$V_{RRM}$ Rated                   | $T_j=25^\circ C$  |          | MAX | 0.01   | mA   |
|                        |  | $T_j=110^\circ C$ |          | MAX | 1      |      |
| dV/dt *                | Linear slope up to $V_D=67\%V_{DRM}$<br>gate open    | $T_j=110^\circ C$ |          | MIN | 50     | V/μs |
| (di/dt)c *             | dV/dt= 0.1V/μs                                       | $T_j=110^\circ C$ |          | MIN | 5.3    | A/ms |
|                        | dV/dt= 20V/μs  |                   |          | MIN | 3.5    |      |

\* For either polarity of electrode A<sub>2</sub> voltage with reference to electrode A<sub>1</sub>.

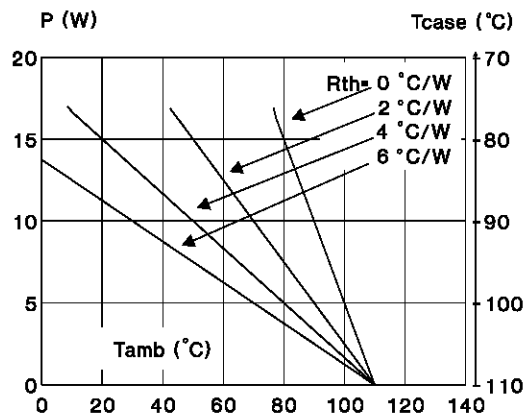
**Fig.1** : Maximum RMS power dissipation versus RMS on-state current ( $F=50\text{Hz}$ ).  
(Curves are cut off by  $(di/dt)_c$  limitation)



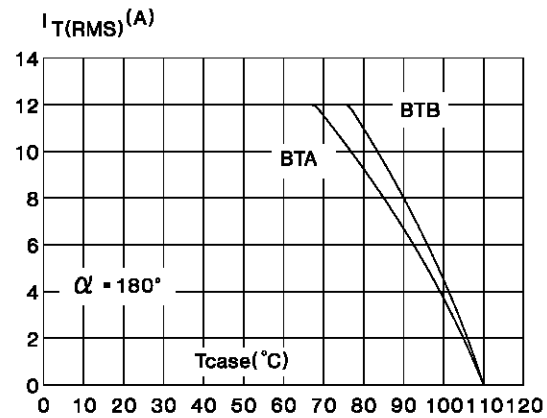
**Fig.2** : Correlation between maximum RMS power dissipation and maximum allowable temperatures ( $T_{amb}$  and  $T_{case}$ ) for different thermal resistances heatsink + contact (BTA).



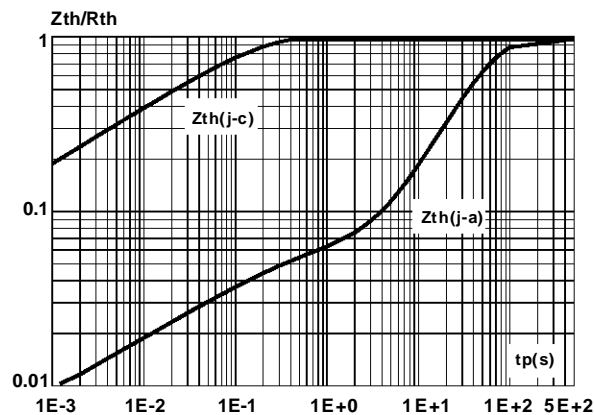
**Fig.3** : Correlation between maximum RMS power dissipation and maximum allowable temperatures ( $T_{amb}$  and  $T_{case}$ ) for different thermal resistances heatsink + contact (BTB).



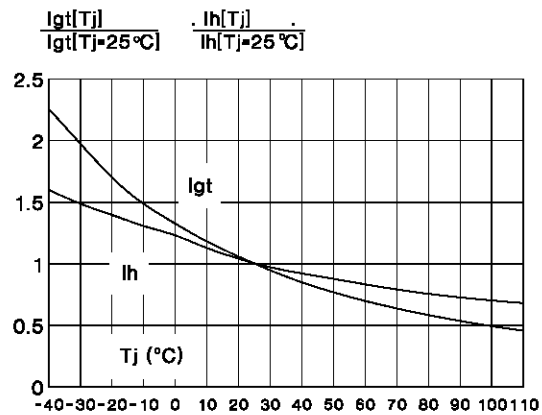
**Fig.4** : RMS on-state current versus case temperature.



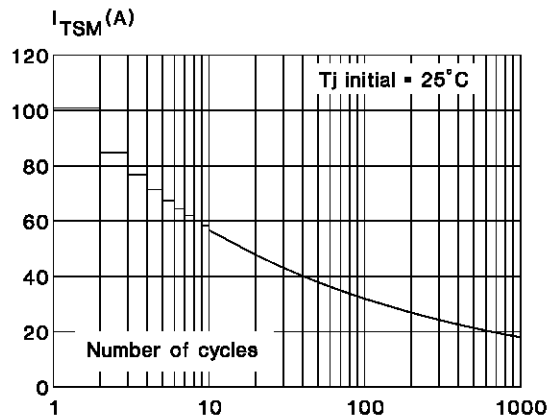
**Fig.5** : Relative variation of thermal impedance versus pulse duration.



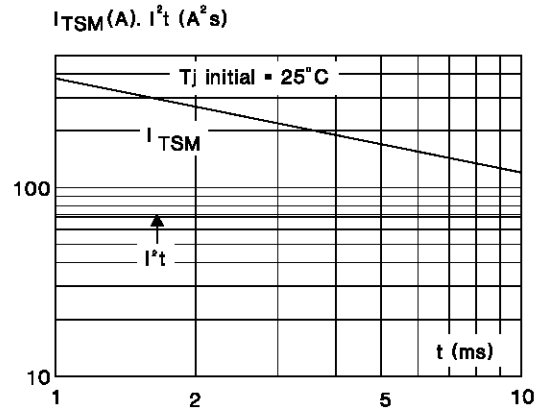
**Fig.6** : Relative variation of gate trigger current and holding current versus junction temperature.



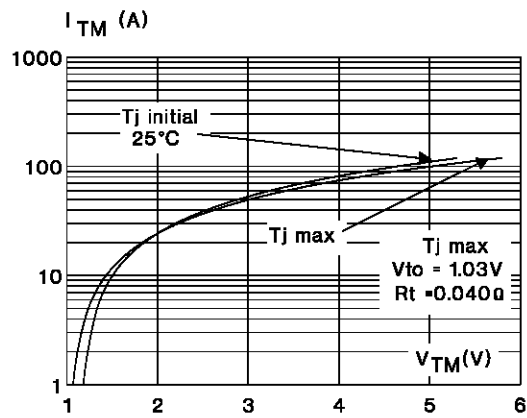
**Fig.7** : Non Repetitive surge peak on-state current versus number of cycles.



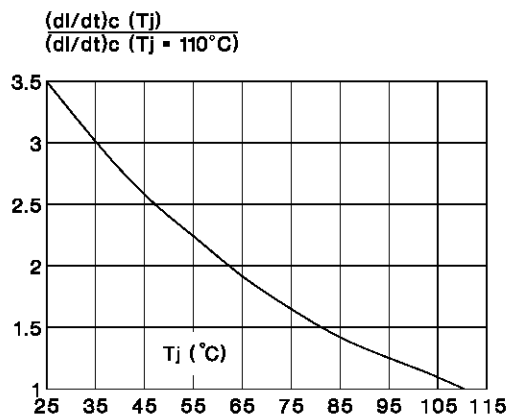
**Fig.8** : Non repetitive surge peak on-state current for a sinusoidal pulse with width :  $t \leq 10\text{ms}$ , and corresponding value of  $I^2t$ .



**Fig.9** : On-state characteristics (maximum values).

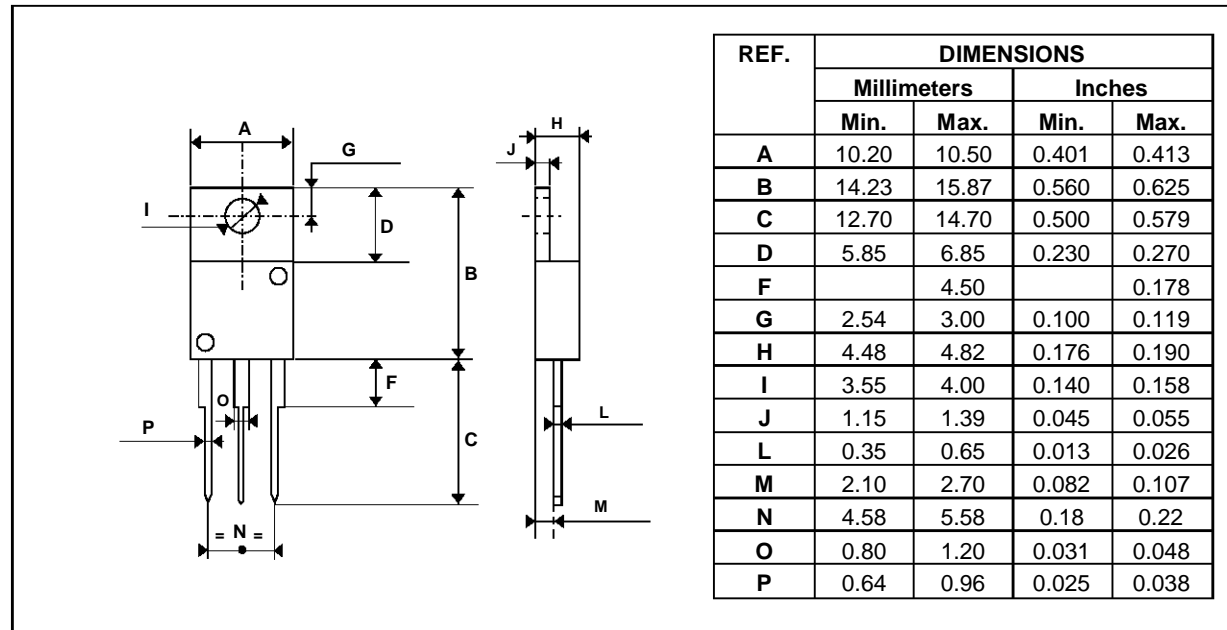


**Fig.10** : Relative variation of  $(dI/dt)_c$  versus junction temperature.



## PACKAGE MECHANICAL DATA

TO220AB Plastic



Cooling method : C

Marking : type number

Weight : 2.3 g

Recommended torque value : 0.8 m.N.

Maximum torque value : 1 m.N.

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